Michigan's Energy Crisis
and
Why Energy Efficiency Must Be a Top Policy Priority

Martin Kushler, Ph.D.
Director, Utilities Program
American Council for an Energy-Efficient Economy

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KEY POINTS

- Michigan faces a severe economic problem with high energy costs. Some would call it a crisis.
- High energy prices are not temporary, they are the new reality. Michigan must plan accordingly.
- Energy efficiency is the only viable near to mid-term policy response.
- Energy efficiency is faster, and costs less than half as much as new electricity or natural gas supplies.
- Energy efficiency policies are well-proven. Other leading states are far ahead of us.

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TOPICS

1) Background: Michigan's Serious Energy Vulnerability
2) Overview of the National Energy Crisis
   - why it is real, & why you should be concerned
   - what's going on in the energy markets & why [special focus on natural gas]
3) Description of how energy efficiency can help

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SOURCES OF INFORMATION

ACEEE (my organization)

- The leading non-profit organization on energy efficiency research in the U.S.
- Frequent testimony before Congress
- Work with all the major leading industry groups
- The only non-profit invited to confidential energy industry "Energy Futures" forum hosted by BP in late 2004.

Energy and Environmental Analysis, Inc. (EEA)

- They do our energy modeling and natural gas forecasts
- Same firm that does natural gas forecasting for the National Petroleum Council

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BACKGROUND: MICHIGAN'S ENERGY VULNERABILITY

- Michigan uses a lot of energy
  - Total cost over $20 billion per year (in 2000) (now likely closer to $30 billion)
  - 8th highest cost burden in the nation
- **Michigan is almost totally dependent on fuels imported from other states and countries**
  - 100% of the coal and uranium we use
  - 96% of oil & petroleum products
  - Three-fourths of the natural gas

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COST OF MICHIGAN'S ENERGY IMPORTS

- Before the current crisis (circa 2000), roughly $12 billion per year was leaving Michigan to pay for fuel imports
- **At current market prices, this dollar outflow is likely to be $18 billion or more**

THIS IS A HUGE ECONOMIC DRAIN ON OUR STATE ECONOMY!

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EFFECTS ON HOUSEHOLDS

- In 2002, the average household nationally spent about $3,000 on energy
  [half for transportation, half for home uses]

- Today that amount is up to $4,600 per year...
  an increase of over 50%,
  or $1,600 taken out of every household's annual disposable income

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ECONOMIC RAMIFICATIONS

This **additional $6 billion** annual drain on Michigan's economy is roughly equivalent to the lost payroll from **closing 60 Greenville Electrolux manufacturing plants.**

Even the Wall Street Journal has written about the unprecedented transfer of wealth, calling it a "bonanza" and "windfall" for the handful of big energy producing states (i.e., AK, NM, WY and TX) and countries (e.g., OPEC).

Bottom line: Michigan is in an economic war regarding energy costs...and we are losing!

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THE ENERGY CRISIS

YES, IT'S REAL. (and not a temporary blip)

Since 2000:

- World oil prices have doubled
- Natural gas prices have nearly tripled
- Spot market coal prices have doubled

Virtually all market experts foresee a prolonged period of high and volatile energy prices

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THE CRISIS IS NOT A TEMPORARY BLIP

THE MARKET FUNDAMENTALS HAVE CHANGED:

- Oil
  - growth in world demand (China & India esp.)
  - OPEC losing control
  - Approaching world production peak
- Natural Gas
  - Primarily North American Market
  - several major negatives (see later slide)
  - no supply relief in sight
- Coal - spot prices have doubled - plentiful supply, BUT major environmental costs are looming
- No magic bullet (Forget about Hydrogen)

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The Natural Gas Crisis

Natural gas prices are a serious problem, and expected to get worse

- Latest gas price forecast is scary
- Several key factors contributing to the problem

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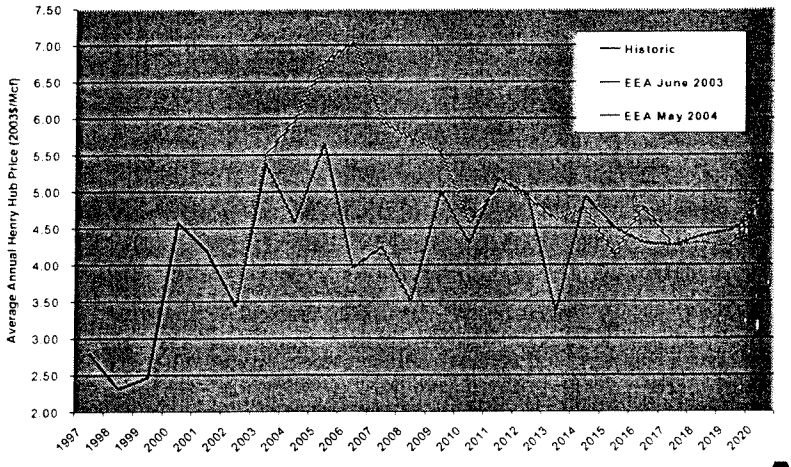
EEA Natural Gas Price Forecast [May 2004 Update vs. 2003 Original]



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Key Factors Contributing to the Problem

- Demand growth has outpaced supply (especially due to dramatic shift to gas for electricity generation)
- No net additional production projected from "lower 48" (additions in Rocky Mtn. region offset by depletion of old fields)
- Imports available from Canada projected to decline from current levels
- Alaska gas pipeline is a decade away
- LNG is the only relatively near term additional supply (and it has substantial risks that may delay and/or raise costs)

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U.S. SOURCES OF NATURAL GAS

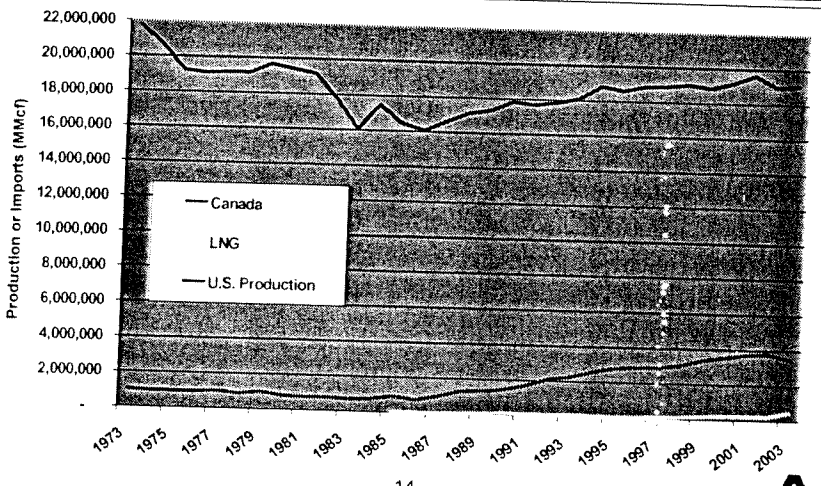

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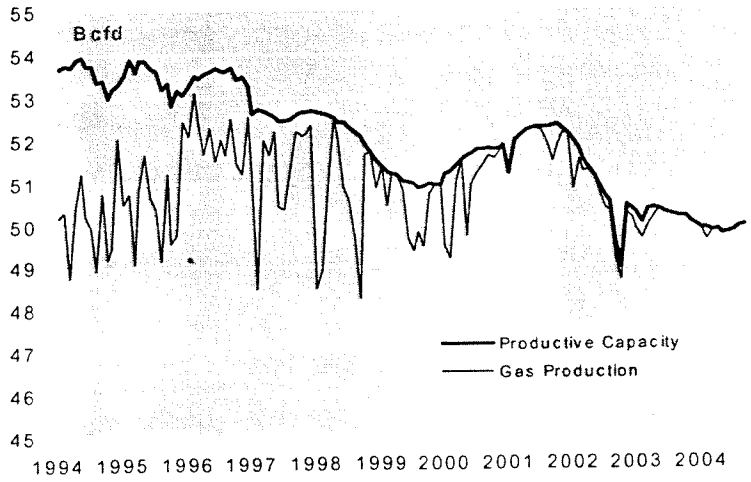
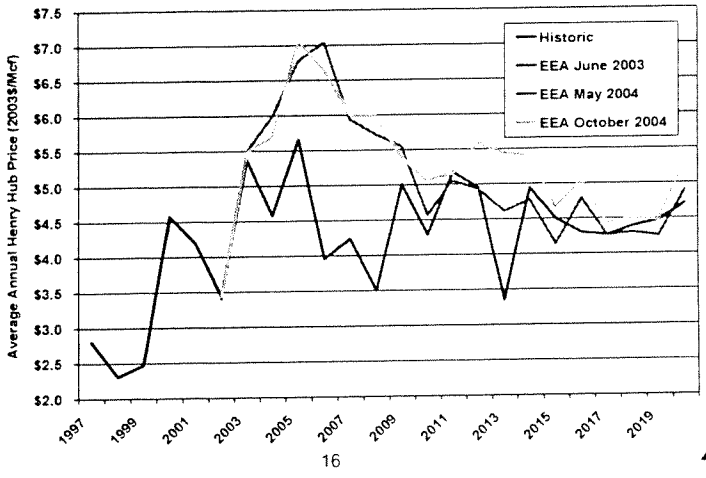
Figure . Lower-48 Dry Gas Production versus Dry Gas Productive Capacity (Source: Petak 2004)



Latest EEA Natural Gas Price Forecast [October 2004]



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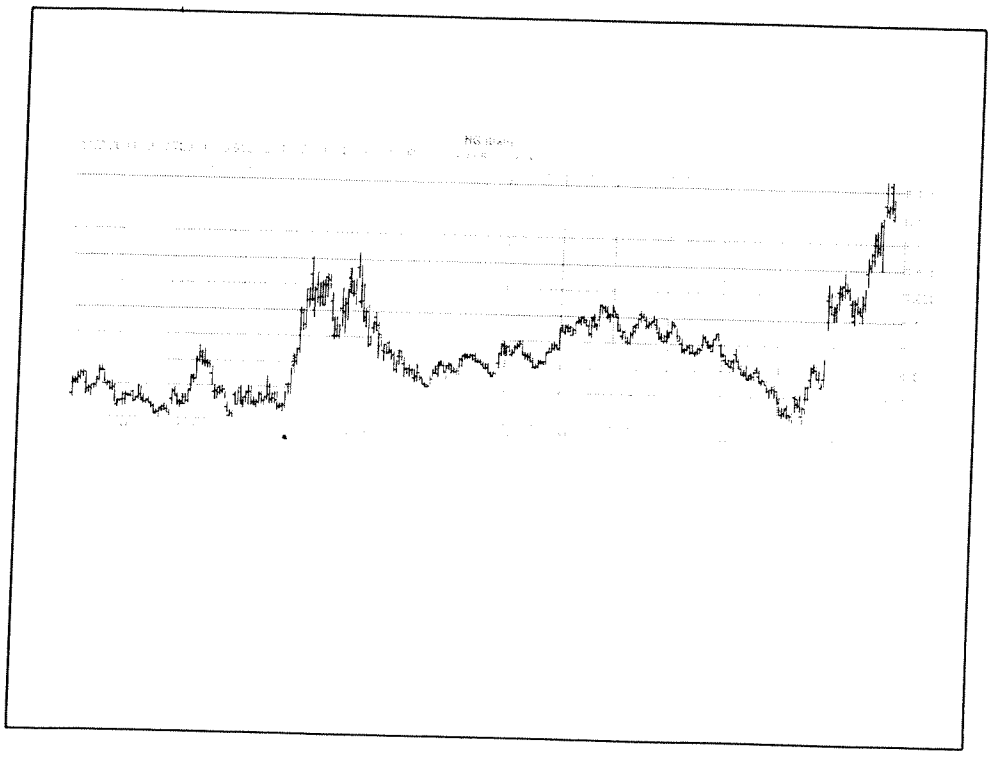

The Natural Gas Crisis Has Particularly Serious Implications for the Midwest

- Very dependent on natural gas for space heating
- Very large industrial use of natural gas
- Very dependent on gas imports from outside the region

[Overall, Midwest imports 92% of the natural gas it uses from other states and countries. Every $1.00 per Mcf increase in price drains an additional $4 billion a year from the region.]

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Other Miscellaneous Motivating Factors

- Billions of $ in potential electric transmission expansion being considered
- Rising costs of environmental compliance, and risks for substantial future costs
- Much of the Midwest also heavily dependent on imports of other fuels (coal, petroleum products, uranium)

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OK, so we believe there is a serious problem….

What can we do about it?

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FORTUNATELY, HELP IS AVAILABLE: ENERGY EFFICIENCY

A recent ACEEE study modeled the effects of aggressive but achievable energy efficiency and renewable energy on national natural gas prices.

Natural Gas Price Effects of Energy Efficiency and Renewable Energy Practices and Policies

R. Neal Elliott, Ph.D., P.E., Anna Monis Shipley, Steven Nadel, and Elizabeth Brown Dec. 2003

URL: http://www.aceee.org/energy/efnatgas-study.htm

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ACEEE Research Approach

Began with sector estimates by State of the near-term (1 year) and mid-term (5 year) implementable potential for energy efficiency and conservation programs.

1. Natural Gas
2. Electricity
3. Renewable Resources

Calculated "reasonably achievable" savings based on sector end-uses (i.e. space heating, motors, lighting, etc.)...about 1% savings/year

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Using EEA Natural Gas Model

- Energy and Environmental Analysis, Inc. (EEA) respected, independent natural gas analysts - used for current and past NPC NatGas studies
- Fully integrated natural gas market model incorporating supply, transmission, storage and consumption at 106 nodes
- Using July 2003 projection as base case
- ACEEE modified consumption only - model handles other issues (e.g., fuel switching, demand destruction)

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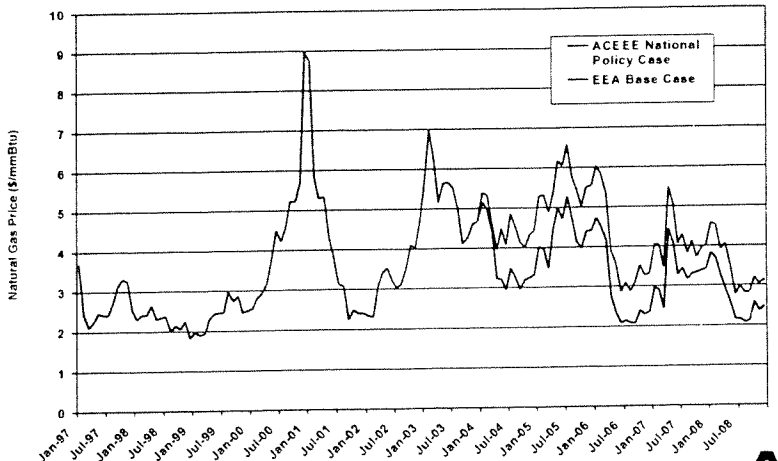
Impact on Henry Hub Natural Gas Pricing



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KEY NATURAL GAS STUDY RESULTS

An aggressive but achievable national policy of Energy Efficiency and renewable energy could:

- Reduce wholesale natural gas prices by 10-20%
- Save consumers over $75 billion in gas costs over the next five years
- Save up to an additional $30 billion in electricity costs over that time period

[Savings = market price effects + direct program savings]

Also, the model showed that strong efforts in a single region can have significant effects in lowering regional natural gas prices (~ 5 to 7%)

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THE GOOD NEWS

Energy Efficiency is available to provide a very effective response

...in fact, it's the only viable near-term option

This is leading to some amazing endorsements:

"***Policies most likely to have an immediate impact are actions to promote consumer conservation and energy efficiency.***"

-- National Petroleum Council, Sept. 2003

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More Nice Quotes

"Based on the Department's analysis, we concur .... that over the next 12 to 18 months there are only limited opportunities to increase supply, and that, therefore, the emphasis must be on conservation, energy efficiency, and fuel switching.

-- DOE Secretary Abraham, June 2003

"Specifically, we need a concerted national effort to promote greater energy efficiency...."

-- Letter to the White House and Congress from the CEOs of the 11 largest U.S chemical manufacturers, January 2004

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Gee, With a Consensus Like That....

.... You'd think we could get an aggressive federal policy to fund and promote energy efficiency.....

Unfortunately, Washington, D.C. is entirely dominated by the energy extraction industries....

The Administration has announced no new initiatives for EE, and the new federal budget proposal contains further cuts to DOE energy efficiency programs.

It looks like the states will continue to have to provide leadership on their own [fortunately, there are some excellent examples of success]

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Latest Great Quote

"We need to lend a greater voice to this thing so that the department [DOE] will feel a need to move more quickly. ***We can't wait much longer for increased energy efficiency in this country.****"*

-- Peter Molinaro
Vice President of Federal & State Affairs
Dow Chemical Company
Washington Post, January 22, 2005

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New Midwest Natural Gas Study

- 8 states (IA, IL, IN, MI, MN, MO, OH, WI)
- Modeling the effects of aggressive but achievable Energy Efficiency programs in the Midwest (save about 1% of sales per year in electricity and natural gas)
- Same contractor (EEA) and technical models
- Looking at effects on wholesale gas prices (Chicago Hub) and on total customer savings (efficiency savings plus price effects)

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FIGURE 1. STATES IN THE MIDWEST NATURAL GAS STUDY

Preliminary Midwest Results (2010)

(5 year program beginning in 2005)

Price effects: reduces wholesale market prices (Chicago Hub) by as much as 13% over 5 to 10 years

Efficiency effects:

Annual savings by 2010:	217 million Mcf
	30 billion KWh
Cumulative by 2010:	783 million Mcf
	109 billion KWh

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Total Midwest Customer Dollar Savings

	2010 Annual	2010 Cumulative
Gas price effects:	$ 1.4 billion	$ 5.2 billion
Gas Efficiency:	$ 1.1 billion	$ 3.9 billion
Elec. Efficiency:	$ 1.86 billion	$ 6.75 billion
Total Savings:	$ 4.34 billion	$15.85 billion
[MICHIGAN:	$800 million	$3 billion]

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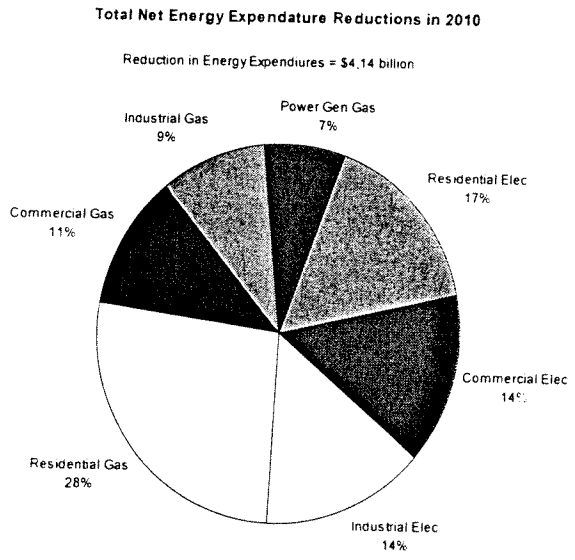

Other Economic Benefits to the Midwest

- 30,000 net new jobs by 2010
- $750 million increase in net annual employee compensation by 2010

[Michigan: 5,200 jobs $130 million payroll]

Plus: significant avoided job losses in Midwest due to avoided "demand destruction"

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New ACEEE Midwest Natural Gas Study

Examining the Potential for Energy Efficiency to Help Address the Natural Gas Crisis in the Midwest

Martin Kushler, Ph.D., Dan York, Ph.D., and Patti Witte, M.A. January 2005

URL: http://aceee.org/pubs/u051.htm

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Why is Govt./Regulatory Policy Needed?

- There are key barriers in the Electric and Gas Utility Industry
- Utilities will not voluntarily provide serious energy efficiency programs
  - Higher sales means higher profit (and vice-versa)
  - Institutional focus traditionally on supply side
- The "market" does not provide a viable substitute for utility sector energy efficiency programs

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MICHIGAN WAS ONCE A LEADER IN ENERGY EFFICIENCY

- **In the early 1990's, Michigan was among the national leaders in utility efficiency programs.**
- Our top utilities were spending 1 to 2% of revenues on energy efficiency
- **Independent evaluations documented that the energy efficiency programs were very cost-effective (1.5 to 2.6 cents per kWh saved)...less than half the cost of new electric supply.**
- The programs were very popular with the public

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ENERGY EFFICIENCY HAS BEEN SHOWN TO BE VERY COST-EFFECTIVE

COST OF CONSERVED ENERGY ACHIEVED[1]

California	1.6 cents to 2.9 cents/kWh
Connecticut	2.3 cents/kWh
Massachusetts	3.2 cents/kWh
Minnesota	1.3 cents/kWh
Mich CPCo	2.6 cents/kWh
Mich DECo	1.5 cents/kWh
Vermont	2.6 cents/kWh

Typical current market cost, generation only: 5.0 cents/kWh

Fully loaded costs, incl. generation, transmission, distribution: 6.0 to 10.0 cents/kWh

[1]Levelized cost of saving electricity, over the useful measure lifetimes

Natural Gas Energy Efficiency Cost-Effectiveness

	Min	Max	Mean	Median	Total
Annual program spending: all programs* (n = 32) ($ million)	$.079	$36	$3.7	$0.954	$131
Annualized 1st year savings: all programs* (million therms)	0.025	10	1.3	0.568	44.8
•Savings: residential programs (n = 20)	0.025	7.0	0.824	0.267	16.5
•Savings: C/I programs (n = 10)	0.025	10	2.4	1.3	23.9
Cost-effectiveness					
•Cost of conserved energy: 1st year $/therm (n = 8)	1.53	6.70	3.63	2.59	
•Cost of conserved energy: lifetime $/therm (n = 7)	0.07	0.80	0.38	0.28	
•Benefit/cost ratio (n = 9)	1.08	5.05	1.98	1.42	

WRONG TURN IN MICHIGAN

- Michigan's utility energy efficiency programs were terminated in 1996, in the rush to utility deregulation
- Many other states maintained their energy efficiency programs, and have realized hundreds of millions of dollars in utility cost savings.

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A BENCHMARK TARGET FOR MICHIGAN

[Based on 20 states with restructuring related funding for energy efficiency and low-income programs.]

Energy Efficiency

- Range: 0.03 to 3.3 mills/kWh
- Median: 1.0 mills/kWh
- $ Range: $1.5 million to $228 million/yr.

>>If Michigan spent at median:
1.0 mills/kWh =
$100 million/yr. for energy efficiency

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BENCHMARK TARGETS (CONT.)

Low Income: Range: 0.1 to 1.2 mills/kWh

- Median: 0.6 mills/kWh
- $ Range: $0.8 million to $100 million

>> If Michigan spent at median:

0.6 mills/kWh= $60 million/yr.

Total Energy Efficiency plus Low-Income Programs:

CURRENT MICHIGAN LI/EE FUND: ~ $45 million/yr.

TOTAL NEEDED TO BE AT MEDIAN: $160 million/yr.

- **[$100 MILLION EE, $60 MILLION LI]**

BENCHMARK TARGETS (CONT.)

On the natural gas side, an equivalent energy efficiency charge would be about 8 cents/MCf, yielding about **$60 million/year for natural gas energy efficiency**

For a typical household, the combined electric and natural gas energy efficiency charge would amount to less than $20 per year... (about a 1% increase)

Compared to the increased energy costs of $1,600 per year (50%) that households have experienced over the last 3 years.

In return for the $20 per year, Michigan would obtain large-scale electric and natural gas energy efficiency programs that would save hundreds of millions of dollars per year.

UTILITY SECTOR POLICY APPROACHES
(The cornerstone of an overall state approach)

1. Establish binding savings targets for utilities/states (e.g., an "energy efficiency portfolio standard")

   [Targets could be established at the state level, as Texas has done, or at the federal level.]

2. Provide funding for energy efficiency through state system benefit funds
3. Require funding for energy efficiency through electric and gas utility rate cases

   [Funding approaches and programs can be tailored to meet the unique needs of each state]

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ADDITIONAL ENERGY EFFICIENCY POLICIES

Energy Efficiency's Next Generation: Innovation at the State Level

Prindle, Dietsch, Elliott, Kushler, Langer & Nadel Nov. 2003

URL: http://aceee.org/pubs/e031full.pdf

Describes and gives examples of seven different categories of state energy efficiency policies (elec & gas)

(Appliance and Equipment Standards; Building Energy Codes; Combined Heat and Power; State Facilities; Tax Incentives for Efficiency; Transportation; Utility Energy Efficiency Programs)

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GOOD POLICY = GOOD POLITICS

Surveys repeatedly show very strong public support for energy efficiency.

Plus, amazingly strong attitudes against importing more energy from outside the state. (MI, 1996)

% of the public that favors or strongly favors:

83% Energy Efficiency

72% Renewable Energy

30% Building a coal or natural gas power plant

21% Building a new nuclear power plant

19% Buying more power from other states or Canada

CONCLUSIONS

- We are in an energy crisis, with the potential to be extremely serious.
- Michigan is particularly vulnerable, due to our high energy use and almost total dependence on imported fuels. Energy costs are crushing our economy.
- Energy efficiency is the only viable near to mid-term option. It reduces costs directly through energy savings, and helps lower market prices.
- Energy Efficiency should be a key part of Michigan's economic development strategy.

[significant environmental benefits are a bonus!]